Device and method distinguishing CD disc

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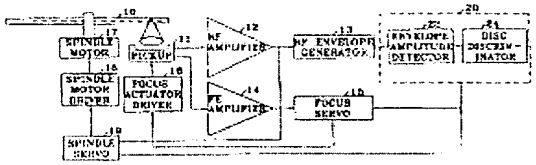
An optical disc discrimination apparatus and method can discriminate a type of a disc loaded on a DVD-RAM drive accurately and simply. The optical disc discrimination apparatus includes a RF envelope generator (13) for generating an envelope signal from a RF signal read from a loaded disc at an off-track state, when only a focusing is accomplished prior to performing a tracking control, an envelope amplitude detector (22) for detecting the amplitude of the detected envelope signal, and a disc discriminator (24) for comparing the amplitude of the detected envelope signal with predetermined reference level and discriminating whether the disc is a CD, a DVD-ROM, or a DVD-RAM, based on the comparison result. Thus, a type of the disc can be discriminated simply and accurately with a change in the amplitude of the RF signal.

FIG. 2



Device and method distinguishing CD disc

Description of corresponding document: **EP1041553**

[0001] The present invention relates to an apparatus for discriminating an optical disc and a method therefor.

[0002] A digital versatile disc (DVD) can record a large amount of information and provide a high picture quality in comparison with a compact disc (CD). As a result, DVDs have come into the spotlight as a storage medium of the next generation. A recent form of DVD is a DVD-RAM free of recording and deletion of data. A DVD-RAM drive apparatus reproducing the DVD-RAM includes an optical pickup compatible with a DVD and a CD so that signals recorded on read only DVDs (DVD-ROM) as well as DVD-RAMs and CDs having a relatively large track pitch, can be reproduced. Track structures of the types of discs which can be reproduced from the DVD-RAM drive apparatus are shown in Figures 1A through 1C.

[0003] Figures 1A through 1C show the track structures of a CD, a DVD-ROM and a DVD-RAM, respectively. In the CD of Figure 1A and the DVD-ROM of Figure 1B, a pit is engraved by approximately 0.1 mu m in a helical fashion from the centre of the disc on a single mirror plane. Here, a track pitch is about 1.6 mu m in case of a CD and about 0.74 mu m in case of a DVD-ROM. The DVD-RAM of Figure 1C is configured as a land/groove track structure having a difference of about 6/ lambda deep. Data can be recorded on both the land and the groove. Since a recording method of the DVD-RAM adopts a change in phase, a data pit region does not have a physical depth as a CD or a DVD-ROM.

[0004] An optical disc reproduction apparatus which can reproduce a CD, a DVD-ROM and a DVD-RAM having a respectively different track structure as described above should discriminate whether a loaded disc is a DVD-RAM, a DVD-ROM or a CD prior to reproducing a signal from the loaded disc.

[0005] Thus, it is an aim of embodiments of the present invention to provide an optical disc discrimination apparatus and method for discriminating a type of a disc according to a difference in amplitude of an envelope waveform of a radio frequency (RF) signal read from the disc at the state where only a focusing is performed.

[0006] According to a first aspect of the present invention, there is provided An optical disc discrimination apparatus for use in an optical disc reproducer which can reproduce a plurality of discs with a single optical pickup, the optical disc discrimination apparatus comprising:a RF envelope generator for detecting an envelope signal from an RF signal read from a loaded disc; and a controller for detecting the amplitude of the envelope signal detected by the RF envelope generator at an off-track state, and discriminating a type of the disc using the detected amplitude.

[0007] Preferably, said RF envelope generator detects an envelope signal by a peak hold and a bottom hold of the RF signal read from said disc.

[0008] Preferably, said off-track state is a state where only a focusing is accomplished before a tracking control is performed.

[0009] Preferably, said controller comprises: an envelope amplitude detector for

detecting the amplitude of the envelope signal detected from said RF envelope generator ;and a disc discriminator for comparing the level of the amplitude detected in the envelope amplitude detector with a predetermined reference level and discriminating whether the disc is a CD, a DVD-ROM, or a DVD-RAM, based on the comparison result.

[0010] Preferably, said envelope amplitude detector samples the envelope signal between a maximum value and a minimum value into n sample signals at a zero cross interval, and obtains an average value of the obtained n peak-to-peak values.

[0011] Preferably, said reference levels are set based on the fact that a CD has a track pitch relatively larger than a DVD-ROM, thus having a larger change in the amplitude of the RF signal, and that a DVD-RAM has no change in the amplitude of the RF signal.

[0012] Preferably, said disc discriminator discriminates whether: a loaded disc is a CD if the level of the detected envelope amplitude is larger than a first reference level; the loaded disc is a DVD-ROM if the detected envelope amplitude is smaller than the first reference level and larger than a second reference level; and the loaded disc is a DVD-RAM if the detected envelope amplitude is smaller than the second reference level.

[0013] According to a second aspect of the invention, there is provided an optical disc discrimination method for discriminating a type of a disc for use in an optical disc reproducer which can reproduce a plurality of discs with only a single optical pickup, the optical disc discrimination method comprising the steps of: (a)obtaining an envelope signal from a RF signal detected from a loaded disc at an off-track state of the disc;(b) detecting the amplitude of the envelope signal obtained in step (a);(c)comparing the amplitude of the envelope signal detected in step (b) with a predetermined reference level; and(d) discriminating whether the disc is a CD, a DVD-ROM, or a DVD-RAM based on the comparison result of step (c).

[0014] Preferably, said step (b) comprises the sub-steps of sampling the envelope signal obtained in step (a) between a maximum value and a minimum value into a predetermined number of sample signals at a zero cross interval, and detecting the obtained predetermined number of the peak-to-peak values and obtaining an average value of the detected peak-to-peak values to thereby detect an amplitude.

[0015] Preferably, said reference levels of step (c) are used for discriminating a CD, a DVD-ROM or a DVD-RAM each of which change in the RF signal amplitude differs from each other, a first reference level is larger than the amplitude of the RF signal detected from the CD, and a second reference level is smaller than the first reference level and larger than the amplitude of the RF signal detected from the DVD-ROM.

[0016] Preferably, in said step (d), it is discriminated that:a loaded disc is a CD if the amplitude of the envelope signal detected from the RF signal is larger than a first reference level; the loaded disc is a DVD-ROM if the envelope signal is smaller than the first reference level and larger than a second reference level; and the loaded disc is a DVD-RAM if the envelope signal is smaller than the second reference level.

[0017] For a better understanding of the invention, and to show how embodiments of the same may be carried into effect, reference will now be made, by way of example, to the accompanying diagrammatic drawings in which:

Figures 1A through 1C show the track structures of a CD, a DVD-ROM and a DVD-RAM, respectively;

Here, the off-track state means a state where only a focusing is performed before a tracking control is performed. At the off-track state, an optical beam traverses a plurality of tracks during a single rotation of a disc according to an amount of eccentricity of the disc. In the case that a reliability problem is raised due to a small amount of eccentricity of the disc, a sled can be moved so that an optical beam traverses a plurality of tracks.

[0023] In this embodiment, a laser wavelength is initialized into 635-650nm for use in a DVD so that a loaded disc has substantially the same beam spot size irrespective of the fact that the loaded disc is a CD or a DVD-ROM. Here, since the track pitch of the CD is not less than twice that of the DVD-ROM referring to Figures 1A and 1B, an amount of RF signals of the adjacent tracks, which is detected when a beam spot is positioned between the tracks in case of a CD becomes relatively smaller than that in case of a DVD-ROM. In case of both a CD and a DVD-ROM, the amplitude of the RF signal becomes large in a track area where data pits exist, and becomes small between the tracks, referring to Figures 3A and 3B. Meanwhile, data is recorded on both a land and a groove in case of a DVD-RAM. When a depth between a land and a groove is 6/ lambda , cross-talk can be minimized. Accordingly, although an optical beam traverses each track, there is no change in the amplitude of the RF signal referring to Figure 3C.

[0024] As described above, the amplitude of the RF signal varies according to the type of the disc. Embodiments of the present invention discriminate disc type using the above feature.

[0025] The RF envelope generator 13 detects an envelope signal by a peak hold and a bottom hold of the input RF signal, and outputs the detected result to the controller 20. The controller 20 converts the input analogue envelope signal into a digital form via an analogue-to-digital converter (not shown) and applies the converted result to the envelope amplitude detector 22. The envelope amplitude detector 22 samples the envelope signal between a maximum value ENVmax and a minimum value ENVmin into n sample signals at a zero cross interval of the applied envelope signal. The envelope amplitude detector 22 detects the magnitude of the n peak-to-peak value of the sample envelope signal, and then obtains an average value ENVp-p, which is expressed by the following equation (1).
"(1)" ENVp - p = SIGMA [ENV max - ENV min] DIVIDED n

[0026] The envelope amplitude detector 22 outputs the average value ENVp-p obtained using the above equation (1) to a disc discriminator 24. The disc discriminator 24 compares an average value ENVp-p of the input envelope amplitude with predetermined reference levels, to perform discrimination of the disc. Here, the predetermined reference levels are used for discriminating a CD, a DVD-ROM or a DVD-RAM each of which having RF signal amplitude values which differ from each other, and are set as shown in Figure 4. The disc discriminator 24 compares the average value ENVp-p of the detected envelope amplitude with a first reference level L1. In the result of comparison, if the average value ENVp-p of the envelope amplitude is larger than the first reference level L1 as shown in Figures 4A, that is, ENVp-p > L1, it is discriminated that the currently loaded disc is a CD. If the average value ENVp-p of the envelope amplitude is smaller than the first reference level L1, the disc discriminator 24 compares the average value ENVp-p of the envelope amplitude with a second reference level L2. In the result of the comparison, if the average value ENVp-p of the envelope amplitude is larger than the second reference level L2 as shown in Figure 4B, that is, L1>ENVp-p>L2, it is discriminated that the currently loaded disc is a DVD-ROM. In the result of comparison, if the average value ENVp-p of the envelope amplitude is smaller than the second reference level L2 as shown in Figure 4C, that is, L2>ENVp-p, it is discriminated that the

currently loaded disc is a DVD-RAM. Here, the first reference level L1 is larger than the second reference level L2. The controller 20 controls the entire system so that a reproduction operation corresponding to a loaded disc can be performed according to a disc type discrimination result of the disc discriminator 24.

[0027] In addition to the above embodiment, a digital servo circuit including an analog-to-digital converter and a digital signal processor DSP detects the amplitude of the RF envelope signal and then transmits the amplitude data or an optical disc discrimination result to a controller such as a microcomputer.

[0028] As described above, the optical disc discrimination apparatus and method can discriminate whether the type of a loaded disc is a DVD-RAM, a DVD-ROM or a CD accurately and simply through a method of measuring the amplitude of the RF envelope at the state where only a focusing is accomplished when the loaded disc is loaded on a DVD-RAM drive.

[0029] The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

[0030] All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

[0031] Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

[0032] The invention is not restricted to the details of the foregoing embodiment(s). The invention extend to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

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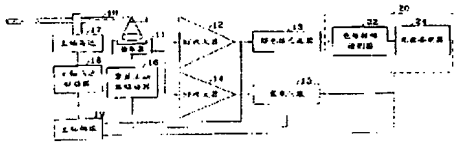
权利要求书2页 说明书4页 附图页数5页

[54]发明名称 鉴别光盘的装置与方法

[57]摘要

一种光盘鉴别装置和方法，能够正确、简单地鉴别装入DVD－RAM驱动器的光盘的类型。该装置包括：RF包络生成器，用于在执行跟踪控制之前，仅完成聚焦时，即在非跟踪状态下，从装入光盘读取的RF信号检测包络信号；包络振幅检测器，用于检测包络信号的振幅；光盘鉴别器，用于比较包络信号的振幅与预定参考电平的大小，并依据比较结果鉴别光盘是CD、DVD－ROM还是DVD－RAM。所以，就可以根据RF信号振幅的变化正确、简单地鉴别出光盘的类型。



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权　利　要　求　书

1、一种光盘鉴别装置，用在能以单一光拾取器再现多种光盘的光盘再现设备中，该光盘鉴别装置包括：

一个RF包络发生器，用于从装入光盘读取的RF信号检测包络信号；

一个控制器，用于检测非跟踪状态下由RF包络发生器检测的包络信号的振幅，并使用检测的振幅鉴别光盘的类型。

2、如权利要求1所述的光盘鉴别装置，其中，所述RF包络发生器根据从所述光盘读取的RF信号的峰值和谷值检测包络信号。

3、如权利要求1所述的光盘鉴别装置，其中，所述非跟踪状态是指在执行跟踪操作之前，仅完成聚焦操作的状态。

4、如权利要求3所述的光盘鉴别装置，其中，所述控制器包括：

一个包络振幅检测器，用于检测从所述RF包络发生器检测的包络信号的振幅；

一个光盘鉴别器，用于对包络振幅检测器检测的振幅电平与预定的参考电平作比较，并根据比较结果鉴别光盘是CD、DVD—ROM还是DVD—RAM。

5、如权利要求4所述的光盘鉴别装置，其中，所述包络振幅检测器在最大值和最小值之间采样包络信号，采得n个零交叉间隔的采样信号，并得到获得的n个峰—峰值的平均值。

6、如权利要求4所述的光盘鉴别装置，其中，所述参考电平的设置是根据CD的光道间距比DVD—ROM的相对大些，因此其RF信号的振幅也有较大的变化，而DVD—RAM的RF信号振幅没有变化。

7、如权利要求6所述的光盘鉴别装置，其中，光盘鉴别器做如下鉴别：

如果检测到的包络振幅大于第一参考电平，那么装入的光盘是CD；

如果检测到的包络振幅小于第一参考电平而大于第二参考电平，那么装入的光盘是DVD—ROM；

如果检测到的包络振幅小于第二参考电平，那么装入的光盘是DVD—RAM。

8、一种用于鉴别光盘类型的光盘鉴别方法，用于仅以单一光拾取器再现多种光盘的光盘再现器中，该光盘鉴别方法包括以下步骤：

(a)在光盘的非跟踪状态下，从装入光盘检测到的RF信号获取包络信号；

(b)检测步骤(a)中所得包络信号的振幅；

(c)将步骤(b)中所得的包络信号的振幅与预定的参考电平作比较；

(d)根据步骤(c)的比较结果，鉴别光盘是CD、DVD—ROM还是DVD—RAM。

9、如权利要求8所述的光盘鉴别方法，其中，所述步骤(b)包括几个子步骤：对步骤(a)中得到的包络信号在最大值和最小值间进行采样，得到预定数量的零交叉间隔的采样信号；检测所得到的预定数量的峰—峰值，并求出峰—峰值的平均值以便检测振幅。

10、如权利要求8所述的光盘鉴别方法，其中，步骤(c)的参考电平用于鉴别CD、DVD—ROM或DVD—RAM，三者的RF信号振幅的变化彼此各不相同：

第一参考电平大于从CD中检测到的RF信号的振幅；

第二参考电平小于第一参考电平，大于从DVD—ROM中检测到的RF信号的振幅。

11、如权利要求10所述的光盘鉴别方法，其中，步骤(d)中，鉴别过程如下：

如果从RF信号检测的包络信号的振幅大于第一参考电平，那么装入的光盘就是CD；

如果从RF信号检测的包络信号的振幅小于第一参考电平而大于第二参考电平，那么装入的光盘就是DVD—ROM；

如果从RF信号检测的包络信号的振幅小于第二参考电平，那么装入的光盘就是DVD—RAM。

说　明　书

鉴别光盘的装置与方法

本发明涉及一种鉴别光盘的装置与方法，并且特别涉及这样一种鉴别光盘的光盘鉴别装置和方法，即通过使用在仅执行聚焦的状态下从盘读出的射频(RF)信号的包络大小、由此精确并且方便地鉴别光盘的类型。

与光盘（CD）相比较，数字多功能光盘（DVD）能够记录大量的信息，并能提供高画面质量。因此，DVD 作为下一代的存储工具，已成为公众关注的中心。DVD 新近的形式是能够自由记录和删除数据的 DVD—RAM。再现 DVD—RAM 的 DVD—RAM 驱动装置包括一个与 DVD 和 CD 兼容的光拾取器，这样，能够再现记录在 DVD－ROM 以及具有较大光道间距的 DVD—RAM 和 CD 上的信号。可从 DVD—RAM 驱动装置得到再现的光盘的光道结构如图 1A 到 1C 所示。

图 1A 到 1C 分别表示了 CD、DVD—ROM 和 DVD—RAM 的光道结构。在图 1A 的 CD 和图 1B 的 DVD—ROM 中，在光盘单反射平面上从盘的中心开始，以一种螺旋形式大约 0.1 μm 刻一凹坑。在此，光道间距在 CD 上大约为 1.6 μm，在 DVD—ROM 上大约为 0.74 μm。图 1C 的 DVD—RAM 是由深度相差 6/λ 的平台/凹槽光道结构构成的。数据既可记录在平台光道上，又可记录在凹槽光道上。由于 DVD—RAM 的记录方法采用了相位的变化，数据凹坑区没有如 CD 或 DVD—ROM 的物理深度。

如上所述，能够再现分别具有不同的光道结构的 CD、DVD—ROM 和 DVD—RAM 的光盘再现装置应该在从装入的光盘再现信号之前，就鉴别出装入的光盘是一张 DVD—RAM，还是一张 DVD—ROM 或是 CD。

本发明的目的是提供一种光盘鉴别装置和方法，用于根据在仅执行聚焦的状态下，从光盘读出的射频（RF）信号的包络波形的振幅的不同，来鉴别光盘类型。

为了达到本发明的上述目的，提供了一种光盘鉴别装置，用在可仅用单一的光拾取器再现多种光盘的光盘再现器中，该光盘鉴别装置包括：一个 RF 包络发生器，用于从装入光盘读取的 RF 信号检测包络信号；一个控制器，用于在非跟踪（off—track）状态下检测由 RF 包络发生器检测的包络信号的

振幅，并且根据检测到的振幅鉴别光盘的类型。

本发明还提供了一种鉴别光盘类型的光盘鉴别方法，用在仅以单一光拾取器再现多种光盘的光盘再现器中，该光盘鉴别方法包括以下步骤：(a) 在光盘的非跟踪状态下，从装入光盘检测到的RF信号获取包络信号；(b) 检测步骤 (a) 中所得包络信号的振幅；(c) 将步骤 (b) 中所得的包络信号的振幅与预定的参考电平作比较；(d) 根据步骤 (c) 的比较结果，鉴别光盘是CD、DVD—ROM还是DVD—RAM。

通过参考附图对优选实施例进行详细描述，本发明的上述目的和其它优点将会变得更加清楚，其中：

图1A到1C分别表示CD、DVD—ROM和DVD—RAM的光道结构；

图2表示根据本发明的优选实施例所得到的光盘鉴别装置的构造；

图3A到3C是从图1A到1C中每种光盘在非跟踪状态下读取的RF信号的波形图；

图4A到4C是从图3A到3C的每个RF信号检测到的包络信号的波形图。

参考附图说明本发明的优选实施例。

图2表示根据本发明的优选实施例所得到的光盘鉴别装置的构造。图2所示的装置包括：光拾取器11，用于从装入光盘驱动器（未表示出）中的光盘10读取信号；RF放大器12，用于放大由光拾取器11读取的高频RF信号；RF包络发生器13，用于接收经RF放大器12放大了的RF信号并检测和生成一个包络。图2所示装置还包括：一个聚焦误差（FE）放大器14，用于放大从由光拾取器11读取的RF信号检测的FE信号；一个聚焦伺服15，用于接收从FE放大器14得到的放大后的FE信号，并生成一个控制信号，用于聚焦伺服控制操作；一个聚焦执行器驱动器16，用于对应于聚焦控制信号，驱动光拾取器11中的聚焦执行器。同时，图2所示装置包括：一个主轴伺服19，用于通过RF放大器12的再现时钟，生成对光盘10的旋转控制操作的控制信号；一个主轴马达驱动器18，用于相应于主轴伺服19的旋转控制信号驱动主轴马达17以旋转光盘10。控制器20控制聚焦伺服15和主轴伺服19的全部操作。控制器20包括：一个包络振幅检测器22，用于通过模/数转换器（未表示出）接收由RF包络发生器13生成的RF包络信号，并用于检测接收到的RF包络信号的振幅；一个光盘鉴别器24，用于使

用包络振幅检测器 22 检测出的 RF 包络信号的振幅来鉴别光盘的类型。图 2 所示的具有上述构造的装置的光盘鉴别操作，可参考图 3A 到 3C 与图 4A 到 4C 进行更详细的描述。

当装入一张光盘如 CD、DVD—ROM 或 DVD—RAM 时，控制器 20 则发出命令，控制聚焦伺服 15 和主轴伺服 19 的伺服操作。根据控制器 20 的指令，主轴伺服 19 驱动主轴马达驱动器 18，使主轴马达 17 以恒定角速度旋转，从而使光盘 10 以恒定速度旋转。根据控制器 20 的指令，聚焦伺服 15 驱动聚焦执行器驱动器 16，使光拾取器 11 中的物镜上下移动，通过调试进行聚焦。这里，控制器 20 控制光盘 10 的旋转，所以转速不是太快，以便于对所有类型的可再现光盘保持聚焦状态。

光拾取器 11 从旋转的光盘 10 读取一个 RF 信号，并将其输出到 RF 放大器 12。RF 放大器 12 以预定量值放大输入的 RF 信号，然后输出到 RF 包络发生器 13。如图 3A 到 3C 所示为 RF 放大器 12 的输出。

图 3A 到 3C 表示的是 RF 信号的波形图，这些信号是从图 1A 到 1C 的每种光盘中读取并在非跟踪状态由 RF 放大器 12 放大后生成的。这里的非跟踪状态的意思是，在跟踪控制执行之前仅执行聚焦操作的状态。在非跟踪状态下，光束按照光盘一定的离心率，在光盘的单个旋转期间扫过多个光道。所以，对于光盘离心率较小的情况，就存在可靠性问题，这时可以通过移动滑轨(sled)以使光束扫过多个光道。

在该实施例中，用在 DVD 中的激光波长初始化为 635—650nm，这样无论装入的光盘是 CD 还是 DVD—ROM，都具有大小完全相同的光点。在此，参考图 1A 和 1B，由于 CD 的光道间距不小于 DVD—ROM 光道间距的 2 倍，所以装入 CD 时，光点在光道间定位时检测出的邻近光道的 RF 信号量，比装入 DVD—ROM 时相对小些。参考图 3A 和 3B，对于 CD 和 DVD—ROM，RF 信号的振幅在有数据凹坑的光道区中变大，而在光道之间变小。而在 DVD—RAM 中，平台和凹槽处都记录数据。当平台凹槽深度之间相差 $6/\lambda$ 时，串扰将减至最小。因此，由图 3C 可知，尽管光束扫过每条光道，但 RF 信号的振幅不发生变化。

如上所述，RF 信号的振幅随光盘类型变化而变化。本发明正是利用这一特点鉴别光盘类型的。

RF 包络发生器 13 根据输入 RF 信号的峰值和谷值检测包络信号，并且

将检测结果输出到控制器 20。控制器 20 通过模/数转换器（未表示出）将输入的模拟包络信号转化为数字信号的形式，并将转换结果送到包络振幅检测器 22，振幅检测器 22 在最大值 ENVmax 和最小值 ENVmin 之间对包络信号采样，生成所采用的包络信号的 n 个零交叉间隔采样信号。包络振幅检测器 22 检测出采样包络信号的 n 个峰—峰值的大小，即得到平均值 ENVp-p，可用下面的等式（1）表示：

$$ENVp-p=\frac{\sum[ENV\,max-ENV\,min]}{n} \qquad \cdots (1)$$

包络振幅检测器 22 将由上面（1）式求出的平均值 ENVp-p 输出到光盘鉴别器 24。光盘鉴别器 24 将输入包络振幅的平均值 ENVp-p 与预定的参考电平进行比较，以执行光盘的鉴别。在此，预定的参考电平用于鉴别 CD、DVD—ROM 或 DVD—RAM，这三者的 RF 信号的振幅各不相同，如图 4 所示。光盘鉴别器 24 将检测到的包络振幅的平均值 ENVp-p 与第一参考电平 L1 相比较。比较结果中，如果包络振幅的平均值 ENVp-p 比第一参考电平 L1 大，如图 4A 所示，即 ENVp-p > L1，则可鉴别出当前装入的光盘是 CD。如果包络振幅的平均值 ENVp-p 比第一参考电平 L1 小，光盘鉴别器 24 再将包络振幅的平均值 ENVp-p 与第二参考电平 L2 比较。比较结果中，如果包络振幅的平均值 ENVp-p 比第二参考电平 L2 大，如图 4B 所示，即 L1 > ENVp-p > L2，则可鉴别出当前装入的光盘是 DVD—ROM。比较结果中，如果包络振幅的平均值 ENVp-p 比第二参考电平 L2 小，如图 4C 所示，即 L2 > ENVp-p，则可鉴别出目前装入的光盘是 DVD—RAM。其中，第一参考电平 L1 比第二参考电平 L2 大。控制器 20 控制着全部系统，所以对装入光盘的再现操作可以根据光盘鉴别器 24 对光盘类型的鉴别结果进行。

除了上述的实施例，包括一个模/数转换器和一个数字信号处理器 DSP 的数字伺服电路，检测 RF 包络信号的振幅，随后将振幅数据或光盘鉴别结果传送到控制器，如微型电脑。

如上所述，该光盘鉴别装置和方法通过当在 DVD—RAM 驱动器中装入光盘时，测量在仅完成聚焦操作的状态下 RF 包络振幅的方法，能正确、简单地鉴别装入的光盘是 DVD—RAM，还是 DVD—ROM 或是 CD。

说　明　书　附　图

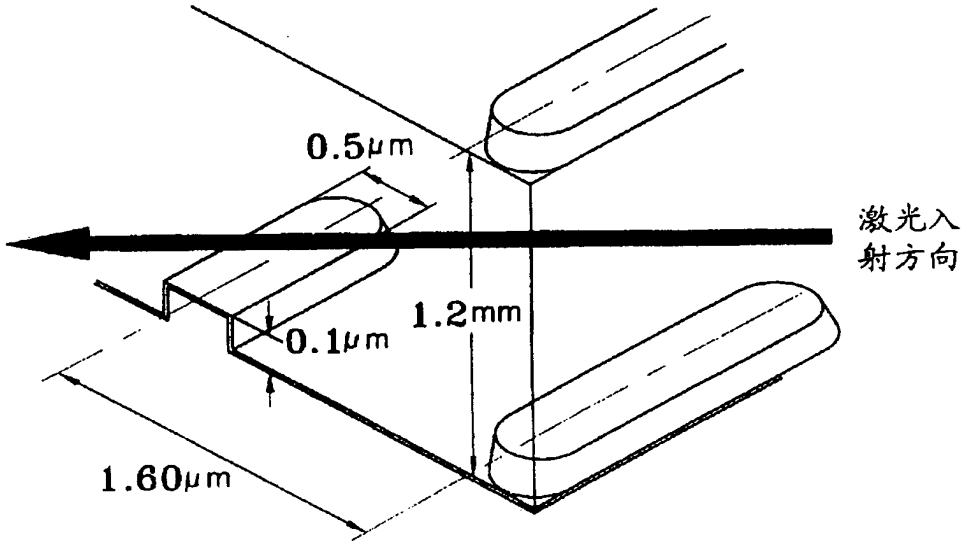

图 1A

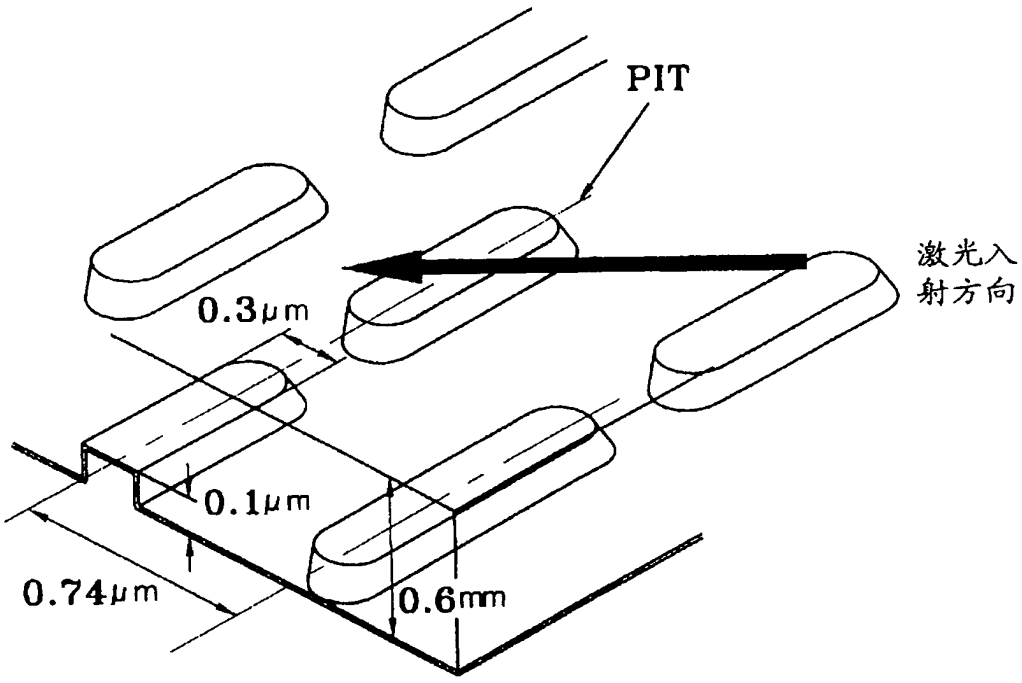

图 1B

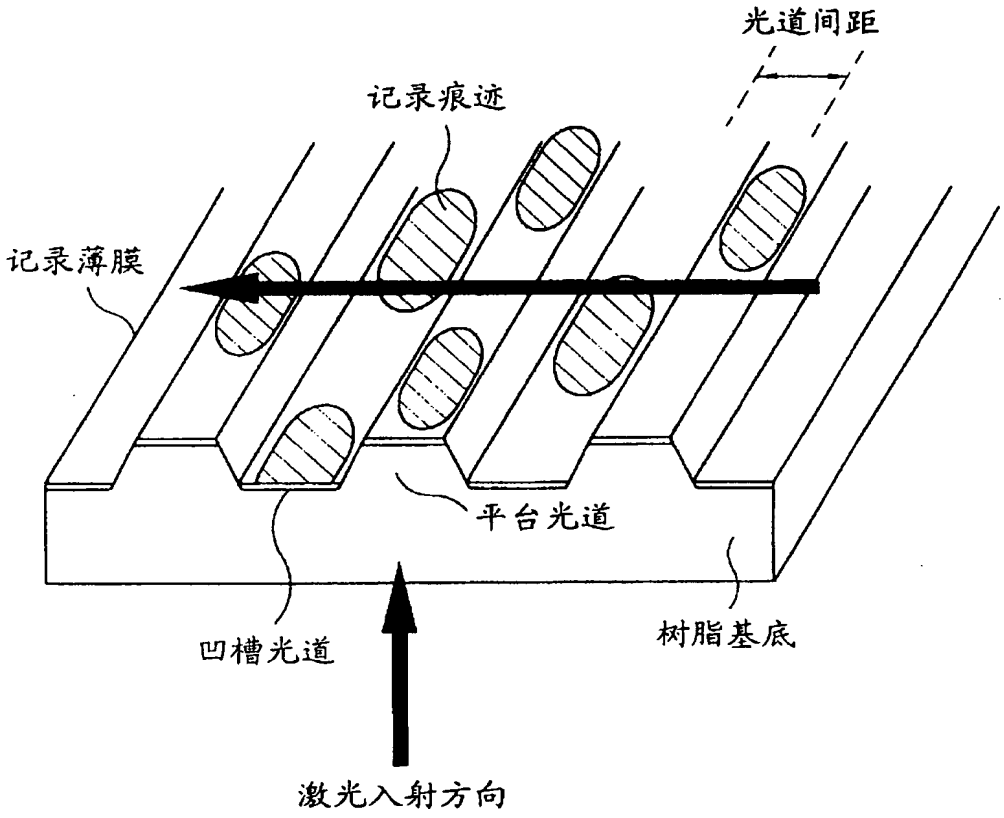

图 1C

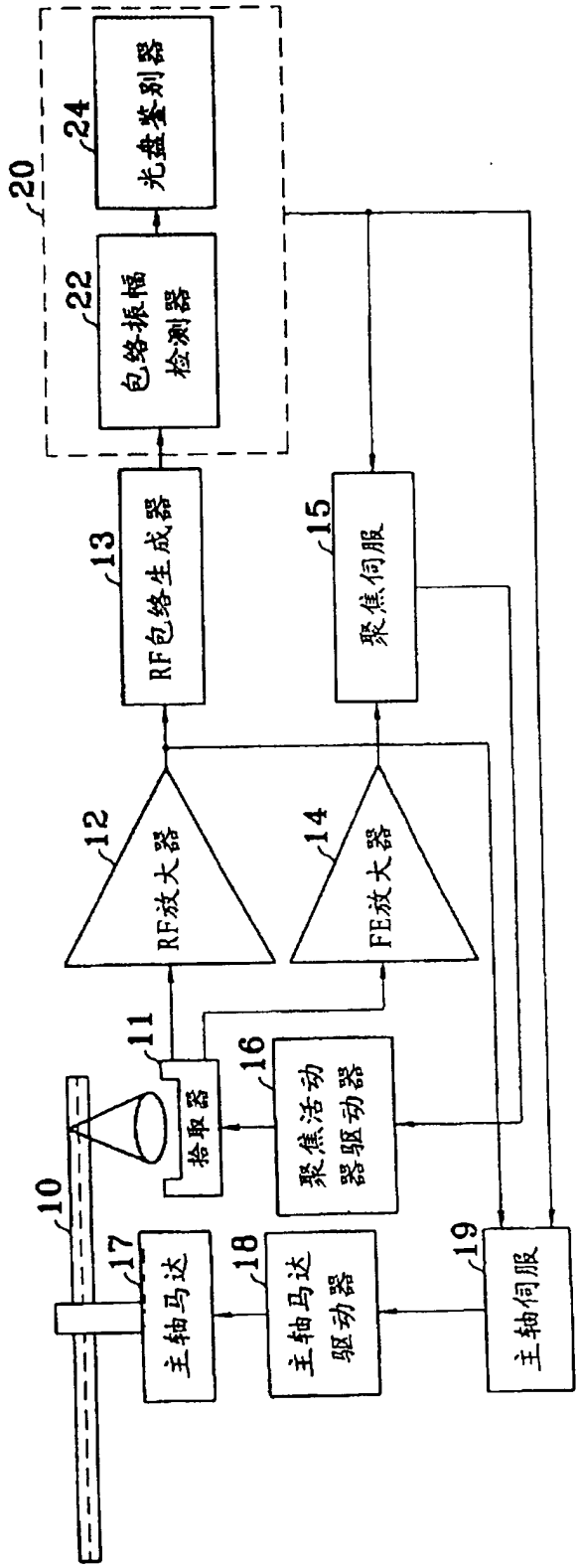
20
24
光盘鉴别器
22
包络振幅检测器
13
RF包络生成器
15
聚焦伺服
12
RF放大器
14
FE放大器
11
拾取器
16
聚焦活动器驱动器
10
17
主轴马达
18
主轴马达驱动器
19
主轴伺服

图 2

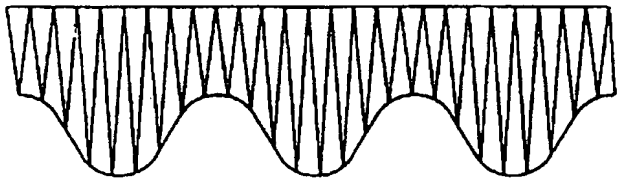

图 3A

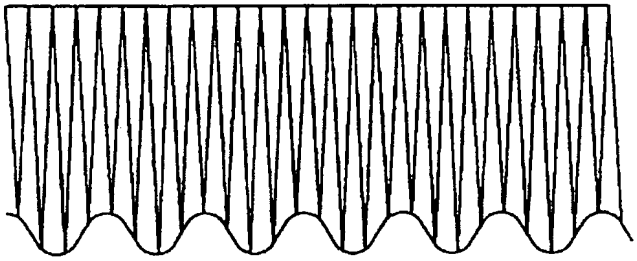

图 3B

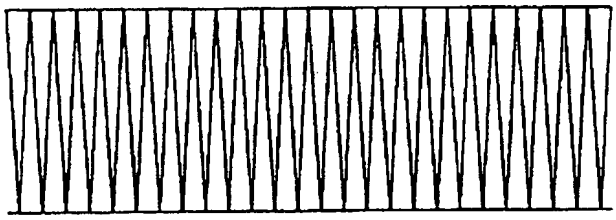

图 3C

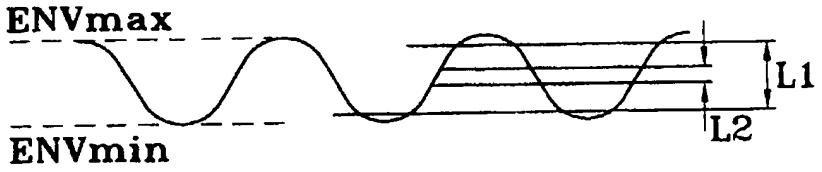

图 4A

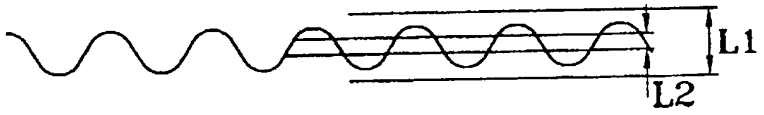

图 4B

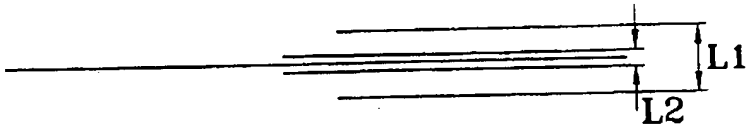

图 4C

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